

PATENT SPECIFICATION

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COMPLETE SPECIFICATION

Improvements in Pipe Bends or Elbows

We, JUNKERS & Co., G.m.b.H., a German Company, of 6, Steiermaerkerstrasse, Stuttgart-Feuerbach, Germany, (Assignees of DESSA WÄRMEGERAETE G.m.b.H., a German Company, of 6, Steiermaerkerstrasse, Stuttgart-Feuerbach, Germany,) do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention concerns pipe bands or elbows, especially suitable for connecting the pipe sections of heat exchangers for gas-heated fluid heaters.

Hitherto, pipe bends or elbows of the aforementioned type, have been bent from pipes of circular cross-section having inner diameters corresponding approximately to the outer diameters of the pipe sections to be connected. Such round pipes have to be bent with a comparatively large radius of curvature, since if a minimum curvature is exceeded, there is a danger that the pipe may break or fracture at the inner curvature of the pipe. Consequently, the spacing or distance between the pipe sections to be connected by these elbows must also be comparatively large. Furthermore, the crowns of these pipe bends lie at a correspondingly remote distance from the connection ends of the pipe sections to be connected. Thus, a heat exchanger fitted with these known form of elbows as well as the casing enclosing the same must be of larger dimensions than is required from the heat exchange point of view.

The dimensions of such heat exchangers may, in contradistinction, be considerably reduced without affecting the efficiency of the heat exchange if, in accordance with the invention, the pipe bends or elbows are made from piping of oval, flat-sided or other suitable non-circular cross-section which is bent to the desired shape in the

plane of the narrowest width extending through the centre line of the pipe, the open ends of the pipe being brought into cylindrical form for connection with the corresponding ends of the pipe sections of the heat exchanger.

These pipe bends or elbows may be bent with a considerably smaller radius of curvature than is the case with pipes of circular cross-section, so that the relative distance between the open connecting ends as well as the radius of the bends or elbows may be smaller than is possible with pipe bends or elbows made from round pipes. Thus, the use of pipe bends or elbows in accordance with this invention also enables the pipe sections of the heat exchanger to be connected to be placed closer together than hitherto, so that the heat exchanger becomes more compact. Thus, the casing surrounding the heat-exchanger may be also correspondingly reduced in size, owing to the smaller radius of the pipe bends or elbows according to the invention.

The invention is further described with reference to the accompanying drawings which illustrate one embodiment of the invention by way of example only and in which:

Fig. 1 is a plan view of a heat exchanger for gas-heated fluid heaters;

Fig. 2 a longitudinal section through a pipe or bend or elbow; and

Fig. 3 a section along the line III—III of Fig. 2.

Referring to the drawings, extending through the laminae jacket 1, which completely encloses the heat exchanger, are a plurality of sections 2 of a water pipe which is connected at one end to a cold water supply and at the other end to a warm water outlet. Equidistantly spaced from one another on the pipe sections 2 are a number of laminae 3 which extend across the jacket 1 and are secured to opposite

[Price 2/6] 45

sides thereof. The outer ends of adjacent pipe sections 2 which project through the jacket 1 are interconnected by pipe bends or elbows 4. These pipe bends or elbows 4 5 are made from piping of oval, flat sided or other suitable non-circular cross-section which is bent to the desired shape in the plane of the narrowest width of the pipe extending through the centre line thereof, 10 which is indicated in Fig. 3 by a chain-dotted line 3. The open connecting ends 6 of the pipe bend or elbow are shaped to form cylindrical connecting portions which are slid on to the connecting ends of the 15 pipes 2 and then secured in position by soldering or welding.

In Fig. 1 the hitherto customary type of pipe bend or elbow 7 made from round piping is shown in dotted lines. It will 20 be readily observed that the radius a and the outer length b of the pipe bend or elbow according to this invention are considerably smaller in comparison with the corresponding dimensions a' and b' of the 25 hitherto known pipe bend or elbow 7.

What we claim is:—

1. A pipe bend or elbow especially suitable for connecting pipe sections of heat exchangers for gas-heated fluid heaters, which pipe bend or elbow consists of piping of oval, flat-sided or other suitable non-circular cross-section which is bent to the desired shape in the plane of the narrowest width of the pipe extending through the centre line thereof, and in which the open 35 ends of the pipe are brought into cylindrical form for connection with the corresponding ends of the pipe sections of the heat exchanger.

2. A pipe bend or elbow substantially as 40 herein described with reference to and as illustrated in the accompanying drawings.

3. A heat exchanger for gas-heated fluid heaters fitted with pipe bends or elbows substantially as herein described with reference to and as illustrated in the accompanying drawings. 45

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